



## Memorandum

*To: Stephanie Vaughn (USEPA)  
Elizabeth Franklin (USACE)*

*From: Keegan Roberts, PhD, PE (CDM Smith)  
Scott Kirchner (CDM Smith)*

*Date: October 14, 2015*

*Subject: Summary of sediment sampling and probing effort: LPR River Mile 10.9 and adjacent areas (September 29, 2015), Lower Passaic River Restoration Project*

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), Kansas City District, CDM Federal Programs Corporation (CDM Smith) traveled to the River Mile 10.9 (RM 10.9) site on September 29<sup>th</sup>, 2015 and provided field technical assistance to the EPA and the EPA Environmental Response Team (ERT). The ERT and its subcontractor, Aqua Survey, conducted sediment sampling and probing activities in preparation for a baseline cap performance monitoring event of the RM 10.9 sediment cap.

The impetus for this sampling and probing activity was the discovery of approximately 20 inches of sediments above the RM 10.9 cap during the August 26, 2015 attempt to install SPME samplers at the RM 10.9 sediment cap. The referenced performance monitoring event will use solid-phase microextraction (SPME) passive porewater samplers to assess contaminant concentrations in the sediment bed, in the active cap layer, and/or in the armor stone layer.

CDM Smith provided technical assistance on the following September 29<sup>th</sup> activities:

1. Sediment sampling of 9 locations either above are in the immediate vicinity of the RM 10.9 sediment cap
2. Probing to evaluate the thickness of fine grained sediments associated with mudflats in the general vicinity of the RM 10.9 sediment cap.

Sample locations are presented in Figure 1. Photographs of field activities are presented in Attachment 1. Copies of logbook notes are presented in Attachment 2.

### **Personnel in Attendance**

Keegan Roberts - CDM Smith  
Jeff Catanzarita - EPA ERT  
Chris Gussman - EPA Lockheed Martin (ERT)  
John McBurney - EPA Lockheed Martin (ERT)  
Bob Fristrom - Aqua Survey  
Jim Karwacki - Aqua Survey  
Helen Jones - AECOM  
Claire Murphy-Hagan - AECOM

### **General Summary**

September 29<sup>th</sup> field activities consisted of:

- collecting sediment cores from three locations above the northern portion of the RM 10.9 cap
- collecting a sediment core from one location above the no-dredge zone that bisects the RM 10.9 cap
- collecting sediment cores from three locations above the southern portion of the RM 10.9 cap
- collecting sediment cores from two locations along the river bank opposite of the RM 10.9 cap
- probing twenty locations to the north of the RM 10.9 sediment cap between approximately RM 13.5 and RM 11.5

Sediment cores were collected by AquaSurvey, C. Gussman, and K. Roberts from above the aforementioned portions of the RM 10.9 sediment cap and adjacent areas. Sediment cores did not penetrate the armor stone overlying the sediment cap, nor were they intended to. Following collection, the cores were processed by on-shore ERT personnel by removing any continuous discernible habitat sand layer from the core, and then homogenizing the remaining fine grained sediments. These sediments were containerized and shipped to ERT contracted laboratories (Brooks Rand Lab, TestAmerica and Katahdin Analytical) for the following analyses:

- Polychlorinated biphenyls (PCBs) by EPA Method 1668C
- Dioxin/Furan by EPA method 1613B
- Mercury by EPA method 1631
- Polycyclic aromatic hydrocarbons (PAHs) using isotope dilution analysis by gas chromatography/mass spectroscopy-selected ion monitoring (GC/MS-SIM)
- Grain size by ASTM D422
- TOC by Lloyd Kahn method

Any unsampled portions of the cores were returned to the RM 10.9 cap (see Photo 8).

A description of the core recoveries for the sediment samples are as follows:

Sample Location	Coring Attempt at Location	Approximate Core Recovery	Notes
PRSS-01	1	10-in of sediment with no discernable sand layer	Most northernmost coring location
PRSS-02	1	1-in of sediment above sand layer	Core contents returned to site
	2	8-in of sediment above 6-in of sand	Core was decanted by pouring overlying water from the coring tube; sediments appear cohesive and compacted

Sample Location	Coring Attempt at Location	Approximate Core Recovery	Notes
PRSS-03	1	Minimal recovery	Core contents returned to site
	2	10-in of sediment above a minimal discernable sand layer	---
PRSS-04	1	10-in of sediment with no discernable sand layer; bottom 2-in of sediment appear darker than top 8-in	Coring location in no-dredge corridor
PRSS-05	1	10-in of sediment above 2-in of sand	Coring location in southern portion of RM 10.9 cap
	2	12-in of sediment above 4-in of sand	Duplicate sample
PRSS-06	1	3-in of sediment above sand	Core contents returned to site
	2	Poor recovery	Core contents returned to site
	3	Poor recovery	Core contents returned to site
	4	Poor recovery	Core contents returned to site
	5	Poor recovery	Core contents returned to site
	6	4-in of sediment above sand	Two cores collected for compositing so adequate sample volume available
	7	4-in of sediment above sand	Two cores collected for compositing so adequate sample volume available
PRSS-07	1	6-in of sediment above 2-in of sand	Two cores collected for compositing so adequate sample volume available; most southernmost coring location
	2	6-in of sediment above 2-in of sand	Two cores collected for compositing so adequate sample volume available; most southernmost coring location

Sample Location	Coring Attempt at Location	Approximate Core Recovery	Notes
PRSS-08	1	18-in of sediment with no discernable sand layer; bottom 6-in of sediment appear darker than top 12-in	core collected along riverbank opposite of RM 10.9 cap
PRSS-09	1	8-in of sandy material	core collected along riverbank opposite of RM 10.9 cap; core location near suspected CSO; NOTE: field log mistakenly labels this location as a second location "8" (entry at 1052)

Following core collection activities, probing was conducted to discern if nearby areas of the Passaic River had experienced sediment deposition similar to what had been observed at the RM 10.9 cap. H. Jones accompanied Aqua Survey, C. Gussman, and K. Roberts during the probing activities. Following the probing of twenty locations between approximately RM 13 and RM 11.5, probing efforts were suspended as a result of equipment malfunction and adverse weather conditions. The probing rod used in these efforts broke at a joint, limiting probing to water depths less than 10 ft. Furthermore, the Aqua Survey GPS began malfunctioning as storm system began approaching the survey area. This memorandum notes that ERT plans to return to the site on October 13, 2015 to complete the probing activities. Probing results will be presented in a separate memorandum following completion of these additional probing activities.

As a general note for future consideration, tidal fluctuations and decreasing water levels should be monitored during any on-water field activities at the site. Low water levels nearly prevented the retrieval of the Aqua Survey vessel from the Passaic River at the conclusion of the September 29<sup>th</sup> field activities (see Photo 8).

**Attachment 1**  
**Photographs of Field Activities**



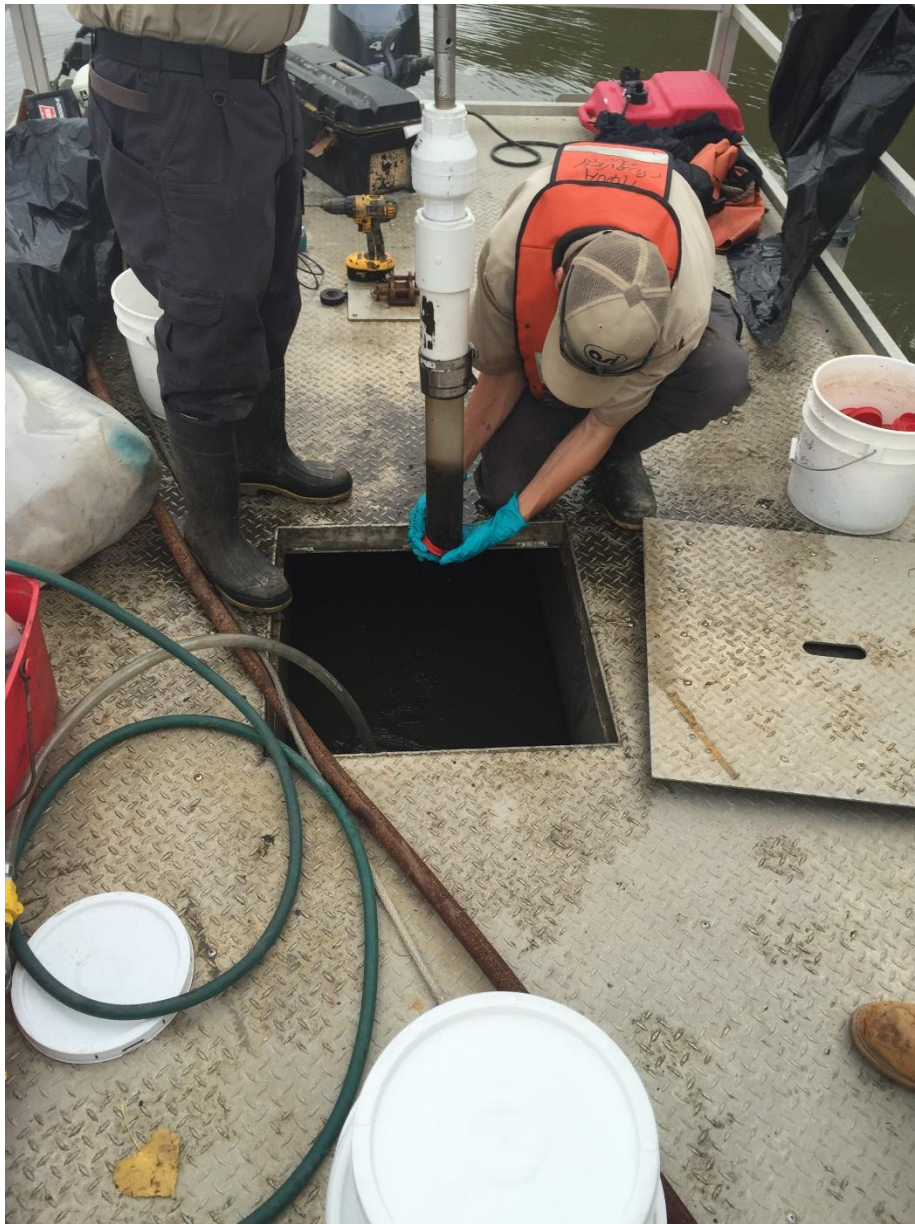
**Photo 1 - On-shore sample processing station  
(9/29/2015)**



**Photo 2 - PRSS-01 sediment core  
(9/29/2015)**



**Photo 3 - PRSS-02 sediment core (second coring attempt; sediment underlain by discernable sand layer)  
(9/29/2015)**



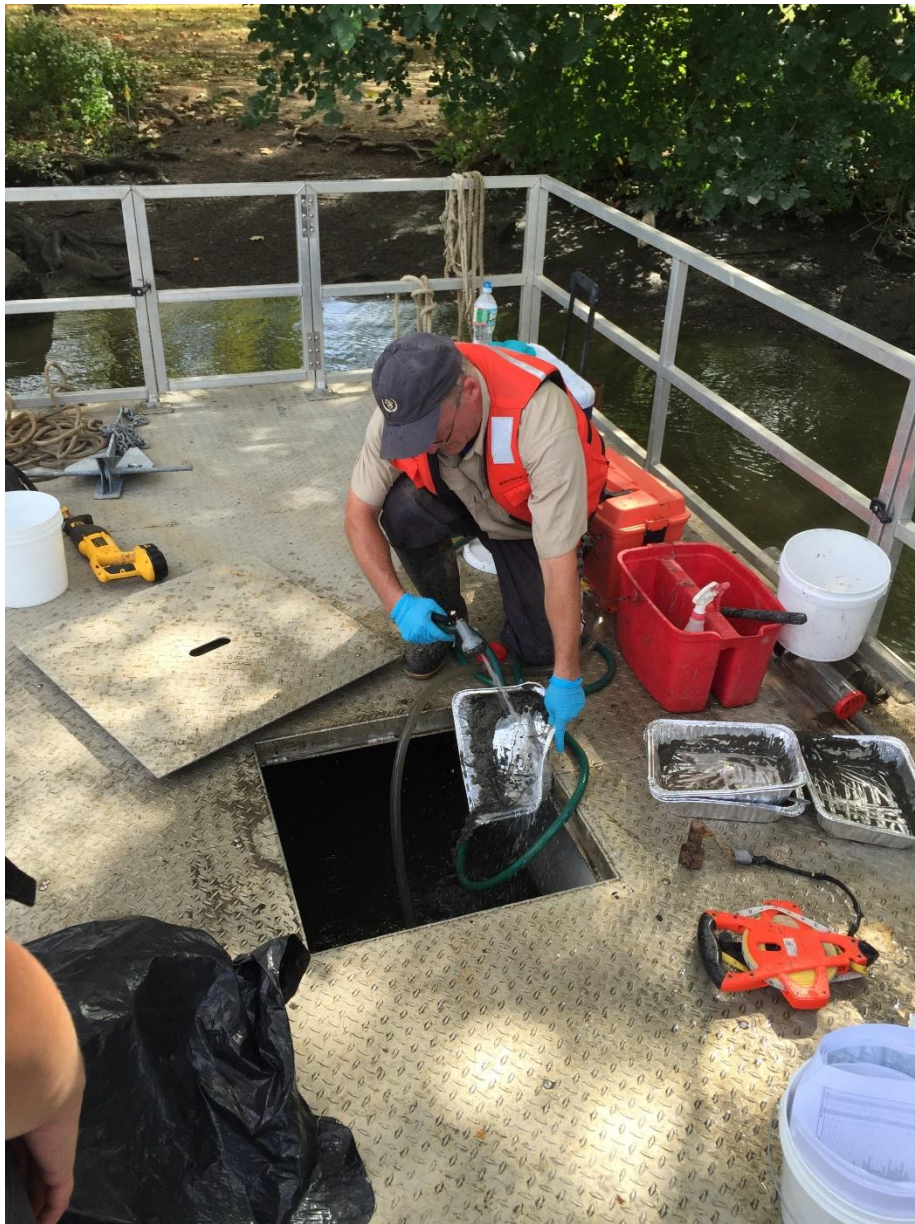
**Photo 4 - Example of core recovery process  
(9/29/2015)**



**Photo 5 - Example of limited sediment above sand layer at PRSS-06  
(9/29/2015)**



**Photo 6 - Example of two different sediment colors at PRSS-08  
(9/29/2015)**



**Photo 7 - Returning unsampled portions of sediment cores to RM  
10.9 cap  
(9/29/2015)**



**Photo 8: Example of difficulties in retrieving sample vessel due to lowering water levels**



IMG\_2619.MOV

## **Video 1: Example of coring process**

## **Attachment 2**

### **Copy of Field Log Notes**



Log book notes September 29.pdf

